Kilbarry SHD

Non-native Invasive Species Management Plan

Doherty Environmental Consultants Ltd

June 2022

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1.0 INTRODUCTION

Doherty Environmental Consultants (DEC) Ltd. has been commissioned by Cork County GAA Board to prepare a *non-native invasive species management plan* for the safe eradication of non-native invasive species, namely *Fallopia japonica, Buddleja davidii and Petasites fragrans* from the footprint of the proposed Kilbarry SHD residential development. This document sets out the approach to be adopted for the eradication of these species from the proposed development site in advance of the commencement of construction works.

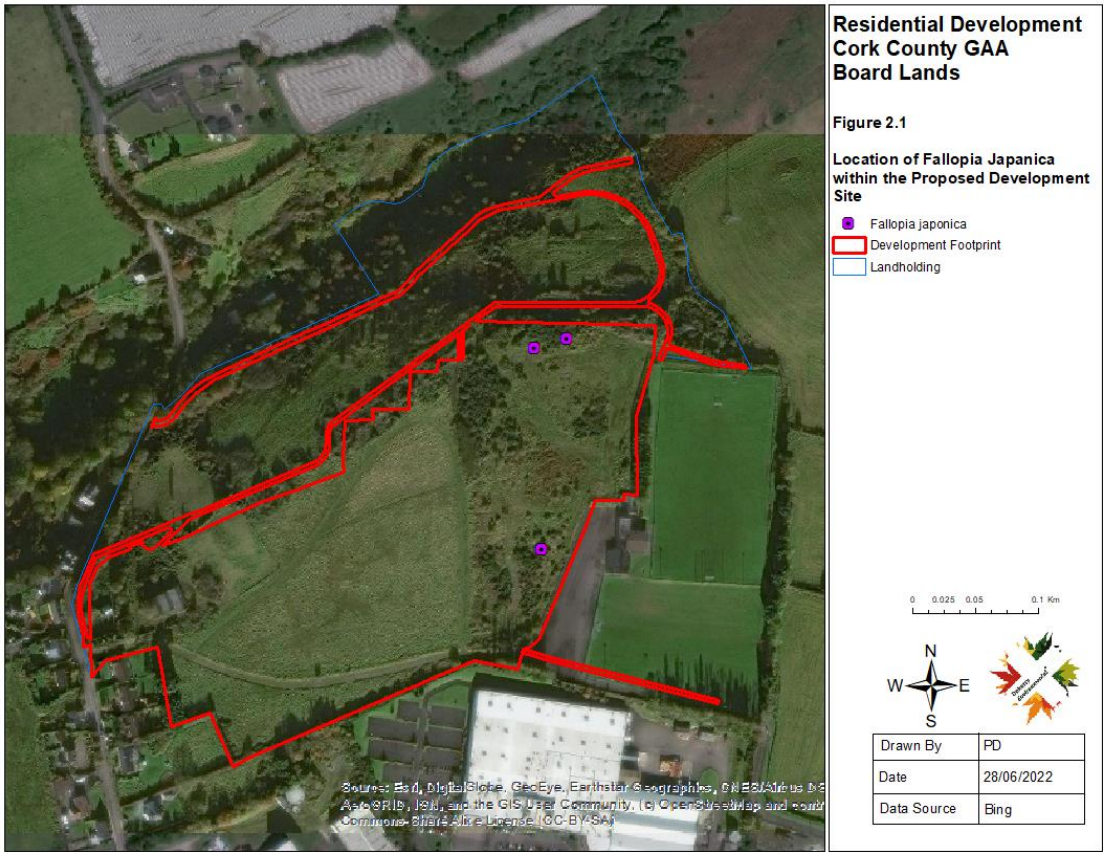
2.0 DESCRIPTION OF THE INFESTATION ONSITE

Small infestations of *Fallopia japonica, Buddleja davidii* and *Petasites fragrans* are located within the landholding of the proposed development. The location of Fallopia japonica is shown on Figure 2.1. A total of three stands of Fallopia japonica have been recorded within the footprint of the proposed development. These are comprised of small and localised infestations.

Buddleja davidii occurs as individual trees and minor infestations throughout the proposed development footprint and is widely distributed within the site.

Petasites fragrans occurs within areas of recolonised grassland mosaic habitat to the east of the project site and also along the boundary of access roads to the site from Old Whitechurch Road.

Given the widely distributed nature of these latter two species within the project site their locations have not been mapped. It will be a requirement of this management plan to resurvey the proposed development footprint in advance of the implementation of management measures so that all stands of Buddleja davidii and Petasites fragrans at the time of this survey are mapped and thus targeted for management. It is proposed that this survey will be completed later during the 2022 growing season in August/September 2022 and that the management measures for the removal of these species will commence later in 2022 after the growing season.



3.0 INVASIVE SPECIES BACKGROUND INFORMATION

3.1 FALLOPIA JAPONICA

F. japonica was originally introduced to the UK and Ireland as an ornamental plant but has spread extensively in the wild. It was first recorded in Ireland in 1902. With its rapid growth of

more than 20mm a day, it forms dense clumps over 3m high which crowd out and prevent the growth of native plants.

All plants occurring in the British Isles are thought to be male sterile (Bailey & Connolly, 2002) and reproduction is almost entirely asexual with very little viable seed produced (0% to <2%) (Tiébré et al., 2007). In spreads through rhizomes and vegetatively in local areas. The rhizome root system, from which new plants grow, can extend several metres away from the original plant and be up to 2m deep. The plant spreads so rapidly not only through progression of its

root system but because any fragments of its stem or root will grow to form a new plant (a piece as small as 2cm can regenerate). This can make it a very difficult plant to eradicate.

F. japonica will grow in any type of soil no matter how poor and is often found along railways, riverbanks, roads and particularly on derelict sites. Given the historical deposition of spoil material within the proposed development site it is possible that Fallopia japonica was introduced to the site during such deposition activities.

F. japonica has been categorised by the NBDC as a species of high impact invasiveness and has been attributed an invasiveness risk score of 20.

3.1.1 Identification

- Japanese Knotweed forms dense clumps and grows up to 3 metres tall
- The stem is hollow with distinct nodes like bamboo and breaks easily. In Spring it is fleshy and red tinged and in Summer it is green with purple speckles.
- Leaves in Spring are pinky red and uncurl as the stem grows. In Summer they become large oval or heart shaped mid-green.
- Flowers are cream coloured and appear in drooping clusters towards the end of August.
- The plant dies before November often leaving behind the upright brown, hollow, woody stalks.
- The stem has a distinctive zigzag form.

3.2 BUDDLEJA DAVIDII

B. davidii is native to China and was first recorded in Ireland in the 1950's. It was introduced as a garden ornamental and is widely planted as a landscape garden ornamental throughout Ireland. It establishes readily on naturally or on anthropogenically disturbed sites such as quarries, urban waste grounds, abandoned cultivated areas, clearcut forests, along railway lines etc. (Tallent-Halsell & Watt, 2009).

In the UK and Ireland naturalised *B. davidii* plants retain seeds on the plant throughout winter and then release the seeds in early spring into summer (Tallent-Halsell & Watt, 2009). Large numbers of seeds are produced by each of the flowering spikes on the plant and the lightweight,

winged nature of the seeds facilitates dispersal. Seeds can remain viable for three to five years. Plants also readily reproduce asexually from stem and root fragments and can regenerate from buried stems, stumps and roots soon after disruption.

No precise studies have been done on the level of impact of *B. davidii*, likely due to its long history of naturalisation (Talent-Hassell & Watt, 2009), but it is likely to displace native plants where it is present. It has been assessed as having a Medium Risk of impact as an invasive species by the National Biodiversity Centre (Invasiveness Risk Score of 15).

4.0 MANAGEMENT REQUIREMENTS

4.1 FALLOPIA JAPONICA

The actions required for the management of *F. japonica* on sites are outlined in Invasive Species Irelands (2016) Best Practice Management Guidelines and are summarised as follows:

- Confirm Japanese knotweed presence.
- Carry out a survey and produce a distribution map of Japanese knotweed on the site.
- Include a 7m radius around the above ground growth in maps to help identify areas with potential rhizome growth.
- Erect signage and close area off from unnecessary interference.
- Identify potential contamination routes to your site and mitigate against these.
- Decide should the programme aim for continuous control on a yearly basis or eradication from the site in the first year.
- Base your decision on an understanding of the biology, size of infestation, potential for reintroduction, proposed future land use and other relevant sensitivities in the area.
- Consider if you can successfully and safely carry out the work yourself, or if professional practitioners, with relevant training and certificates should undertake the work. Remember relevant health and safety legislation and procedures when working near water and on construction sites.
- Identify if sufficient resources are/will be available to complete the work within the planned timescale. It can take 3 years and more of herbicide treatment with monitoring

and follow up control for up to 5 years, so ensure you have sufficient funds to complete the work.

- Where disposal offsite is required ensure disposal options for plant material and contaminated soil are in place prior to work commencing.
- Develop and produce a site-specific control/management plan.
- Where disposal offsite is required obtain a licence from the Department permitting the transport and disposal of the material at an approved facility.
- Monitor for regrowth and/or reintroduction during site visits.

4.2 BUDDLEJA DAVIDII

Actions for the management of Buddleja davidii are outlined in the TII guidance documentation "The Management of Invasive Alien Plant Species on National Roads – Technical Guidance" (December 2020).

Management requirements for this species comprise chemical control and or physical control.

4.3 PETASITES FRAGRANS

Actions for the management of Petasites fragrans are outlined in the TII guidance documentation "The Management of Invasive Alien Plant Species on National Roads – Technical Guidance" (December 2020).

Management requirements for this species comprise chemical control and or physical control.

5.0 MANAGEMENT OPTIONS

5.1 FALLOPIA JAPONICA

There are a number of management options available for eradicating Fallopia japonica from a site. These include herbicide treatment; deep burial method; root barrier membrane method; or offsite disposal.

The method considered to be most appropriate to the management of Fallopia japonica at the Kilbarry SHD site is a combination of herbicide treatment and, where required the root barrier membrane method. The particulars of these methods are detailed in the sub-sections below.

The chemical herbicide treatment will commence during the growing season of 2022 and it will be continued annually up to the commencement of the construction phase of the proposed development. A pre-construction non-native invasive species surveys will be completed in advance of the commencement of construction. This survey will establish whether or not chemical herbicide treatment has been successful in eradicating Fallopia japonica in the intervening period. If chemical herbicide treatment has been successful in eradicating Fallopia japonica from the site between the commencement of this treatment in 2022 and the commencement of the construction phase then no further management will be required. In the event that chemical herbicide treatment has not fully eradicated Fallopia japonica from the proposed development site then the root barrier membrane method will be employed to complete the eradication of this species.

5.1.1 Chemical Herbicide Treatment

Chemical herbicide treatment of the Fallopia japonica infestations within the proposed development site will be undertaken and will commence during the 2022 growing season. A glyphosate herbicide will be used to treat the infestations. As with all plant protection products, it should be used in compliance with the product label and in accordance with Good Plant Protection Practice as prescribed in the European Communities (Authorization, Placing on the Market, Use and Control of Plant Protection Products) Regulations, 2003 (S.I. No. 83 of 2003). Plant protection products containing glyphosate will be applied in late September or early October and early in the growing season (May) to stunt the growth of the plant, consequently reducing the amount of viable above-ground material and the height of the stand.

Chemical herbicide treatment will continue on an annual basis under this treatment regime until the commencement of the construction phase.

5.1.2 Root Barrier Membrane Method

This treatment option requires the provision of a “root-barrier membrane cell” within which contaminated material is contained and buried beneath a minimum of 2m overburden. All

Fallopia japonica above ground plant material and associated overburden contaminated material will be buried in the membrane cell beneath a minimum of 2m overburden. The burial cell will be located under the footprint of the informal turfed play area that will be provided as part of the proposed development. The location of this area is indicated on Figure 5.1. the proposed location of the root barrier membrane cell is under the footprint of a proposed open space active amenity kick about area that forms part of the proposed development. This location is also local to the identified stands of Fallopia japonica and will thus minimise the movement of Fallopia japonica material from infested areas to burial area.

All excavated material associated with the excavation of the infestation and all wash down from any machines and tools which have come into contact with the excavated material will also be contained in this root barrier cell ensuring that all material is wrapped in a suitable membrane and buried beneath a minimum of 2m depth of overburden under the footprint of the active

the contaminated material has been excavated from and will form the base of the formation layers in these locations of the site. The root barrier membrane will extend of a minimum of

7m in all directs from the excavated infestation sites. This will ensure that any Fallopia japonica below ground root material at and surrounding the infestation locations will be buried under the root protection membrane and the footprint of the proposed development and will be prevented from regrowing in this area.

The following criteria are required for successful root membrane treatment of Fallopia japonica:

- All machinery should be decontaminated on site after contaminated material has placed in the burial cell, before a root barrier membrane is placed over it and the backfilling takes place with uncontaminated soil or inert material.

- Accurately map and record the location of the cell site to prevent any future accidental disturbance. Inform future owners of its position.

- Off-site transport of material does not take place, and therefore material is not spread outside of the contaminated area.

- Pre-treat the infestation with herbicide before burial to speed up die-off. Persistent herbicides must not be used prior to burial.

- The minimum design life of the root membrane shall be 50 years. A manufacturer's guarantee is to be supplied by the Contractor.

- The root membrane shall be used for creating the cell for burial, for preventing spread from the encapsulated area and original excavated area, and for protecting services and infrastructure in these areas.

5.2 BUDDLEJA DAVIDII

The stands of *Buddleja davidii* occurring on site are to be cleared during late 2022 during the months of November and December.

All stands of *B. davidii* plants will be marked out with visible markings prior to the commencement of felling. Strips of hazard tape will be tied to each plant so that they are visible to the site clearance operatives.

In order to minimise the dispersal of seed it is recommended that *B. davidii* is felled on site and stockpiled locally to the area it which it is felled. Freshly cut plant material should not be transported large distances across the site to minimise the spread of seed. The stockpiles containing *B. davidii* at the base should be left undisturbed on the ground for a period of one week to whither. Once withered the stockpiles containing felled *B. davidii* material can be removed for disposal.

It is recommended that, to minimise the dispersal of seed, the felling of *B. davidii* be undertaken during period of prevailing calm conditions.

5.3 PETASITES FRAGRANS

Chemical herbicide treatment of the Petasites fragrans infestations within the proposed development site will be undertaken and will commence during the 2022 growing season. A glyphosate herbicide will be used to treat the infestations. As with all plant protection products, it should be used in compliance with the product label and in accordance with Good Plant Protection Practice as prescribed in the European Communities (Authorization, Placing on the Market, Use and Control of Plant Protection Products) Regulations, 2003 (S.I. No. 83 of 2003). Plant protection products containing glyphosate will be applied in late September or early October and early in the growing season (May) to stunt the growth of the plant, consequently reducing the amount of viable above-ground material and the height of the stand.

Chemical herbicide treatment will continue on an annual basis under this treatment regime until the commencement of the construction phase.

6.0 BIOSECURITY MEASURES

A Biosecurity Standard Operating Procedure (SOP) will apply to all staff and equipment that are used in the contaminated area.

6.1 CLEANING OF PLANT & EQUIPMENT PRIOR TO ARRIVAL ON SITE

Prior to arrival on site the Contractor's vehicles and equipment must be thoroughly cleaned. High-pressure steam cleaning, with water > 40 degrees C, is recommended for vehicles and equipment where reasonably feasible. Many roadside garages provide these facilities. If it is

not possible to steam clean the equipment, a normal power hose must be used. After cleaning visually inspection of the equipment will be carried out to ensure that all adherent material and debris has been removed.

Cleaning should not be undertaken on the site or near watercourses. Each field vehicle must carry a 'disinfection box'. This should contain Virkon Aquatic or another proprietary disinfectant, a spraying mechanism, cloths or sponges, a scrubbing brush and protective gloves. Protective gloves must be worn when using any disinfectant solution.

Virkon disinfectant will be applied to the undercarriage and wheels of any vehicles used after cleaning. Disinfectants must be used strictly in accordance with the manufacturer's instructions. They must be disposed of safely and never close to open waters such as drains etc.

Footwear should be dipped in or scrubbed with a disinfectant solution (e.g. Virkon solution).

6.2 CLEANING AND DECONTAMINATING VEHICLES AND EQUIPMENT ONSITE

The following cleaning and decontaminating biosecurity measures will be undertaken on site before personnel, equipment and transport machinery leave the site:

All personnel footwear, equipment and transport vehicles will be washed down in the burial cell.

All personnel footwear, equipment and transport vehicles will be cleaned with Virkon disinfectant. Sprays and brushes will be used to clean the above. All wash down water will be directed into the burial cell. Particularly attention will be given to the cleaning of all wheels and undercarriages of plant and truck vehicles exiting the site. All footwear, plant and vehicles will be inspected to confirm that they are suitably cleaned prior to exiting the burial cell wash down area and that they are free from Fallopia japonica plant material.

6.2.1 Approach to Plant Inspection

All plant leaving the contaminated area will be inspected to ensure it is clean. A record of all inspections will be maintained by the Site Supervisor.

Inspections will focus on identifying the presence or otherwise of fragment in the following locations of plant equipment.

Rubber Tyred Vehicles

- Crevices in upper surface and panels
- Tyres, rims
- Spare tyre mounting area
- Bumpers
- Front and rear quarter panels
- Around and behind grills
- Bottom of radiator vent openings
- Brake mechanisms
- Transmission
- Stabiliser bar
- Shock absorbers
- Front and rear axles
- Beds
- Suspension units
- Exhaust systems
- Light casings and mirrors

Tracked Vehicles

- Crevices in upper surface and panels
- Top of axles and tensioners
- Support rollers

- Between rubber or gridded areas
- Beneath bumpers
- Hatches
- Under casings
- Grills
- Beneath seats
- Beneath floor mats
- Upholstery
- Beneath foot pedals
- Inside folds of gear shift cover

7.0 CONCLUSION

The implementation of the management measures outlined in this plan will aim to largely eradicate the presence of three non-native invasive species within the proposed development site prior to the commencement of construction activities on site. Annual eradication measures will be implemented and will commence in 2022. Monitoring of these measures will be undertaken annually during the implementation of management measures.

Pre-construction surveys will be required in advance of the construction phase. These surveys will identify the need for the implementation of contingency management measures, such as the use of a root barrier membrane, in the event that Fallopia japonica is not fully eradicated from the site by this time.

This plan sets out a protocol for the effect eradication of these species from the proposed development site that will prevent their spread during the construction phase and/or operation phase of the proposed development.

8.0 REFERENCES

National Roads Authority (2010). Guidelines on The Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads.

TII (2020). The Management of Invasive Alien Plant Species on National Roads – Technical Guidance.

Tallent-Halsell, N. G., & Watt, M. S. (2009). The invasive Buddleja davidii (butterfly bush). The Botanical Review, 75(3), 292-325.